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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WONG, ALLEN C	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/616,546	PEKER ET AL.	
	Examiner	Art Unit	
	Allen Wong	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 17 April 2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 4-7, 11 and 13 have been considered but are moot in view of the new ground(s) of rejection.

Response to Arguments

1. Applicant's arguments filed 4/17/07 have been fully read and considered but they are not persuasive.

The 35 U.S.C. 112, second paragraph rejection is withdrawn since claim 5 is amended to depend from claim 4.

Regarding line 10 and lines 13-16 on page 7 of applicant's remarks, applicant states that Rajagopalan does not disclose meet the deficiencies of Meng, Rajagopalan does not adaptively playback the encoded video according to the statistical complexity. The examiner respectfully disagrees. In column 10, lines 19-47; Rajagopalan discloses the instantaneous coding rate R_I includes video complexity and that the instantaneous coding rate is the rate used for encoding and decoding video image data in that the complexities of I, P and B frames from a group of frames are taken into account for ascertaining an optimal decoding and display rate of the video images at the display terminal. Thus, Rajagopalan discloses adaptive playback of the encoded video according to the statistical complexity.

Regarding lines 16-17 on page 7 of applicant's remarks applicant asserts that Rajagopalan does not disclose measuring a visual complexity. The examiner respectfully disagrees. In figure 9, Rajagopalan discloses that the input image data is at

element 900, prior to the picture coder 908. Rajagopalan figure 9 discloses that element 901 for estimating and obtaining a measure of the complexity of the current picture from the input image data at element 900 for obtaining the visual complexity of the current picture of the input image data. Thus, Rajagopalan discloses measuring a visual complexity.

Regarding the last paragraph on page 7 to line 2 on page 8 of applicant's remarks, applicant contends that Meng and Rajagopalan are not combinable. The examiner respectfully disagrees. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one of ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner, as suggested in Rajagopalan's column 3, lines 19-24.

Regarding lines 8-11 on page 8 of applicant's remarks, applicant states that the present invention is not concerned with encoding and decoding video images in an optimal manner, but rather playing back a video at a rate that corresponds to a visual complexity. The playback of video images requires the encoding of image data that

takes into account of the complexity of the video image data for optimally encoding the video image data so as to produce a clear, high quality representation of the video image data by implementing a video encoding/decoding scheme, ie. MPEG, that utilizes optimal encoding recursive rate control for producing the clear playback video images for viewing at the display terminal. Thus, there is a correlation between optimally encoding and decoding video images and playback a video at a rate corresponding to the visual complexity.

Regarding pages 9-10 of applicant's remarks, applicant asserts that dependent claims 10-19 are ignored. The examiner respectfully disagrees. The limitations of dependent claim 10, 12 and 14-19 are written in a similar manner in that the rejection of the claim 1 encompasses the limitations of claims 10, 12 and 14-19. Claim 10 is rejected for similar reasons as claim 1 since concepts of complexity are stated. Claims 15, 17 and 19 are rejected for similar reasons as claim 1 since are clear playback of video, ie. motion blur and spatial filter, is well known and is disclosed to ensure clear display by minimizing distortions, as disclosed above and in the rejection below. Claim 12 is disclosed in Rajagopalan in column 12, ln.3-15, when frame rate R is solved, one can see that the frame rate R is inversely proportional to the complexity C. As for claim 14, of course, when the video is being displayed for viewing, the video is uncompressed via a decoding process, as disclosed in the Meng's section 9. As for claim 16, Meng discloses quantization since the quantization factor is ascertained and utilized in MPEG encoding for permitting the clear display of image data depending on the fine or coarse quantization adjustment that is applied. Claim 18 is visual complexity is measured and

approximated, see the rejection of claim 1. The claims are rejected as diligently as possible based on the set limited amount of time given by the Office. So thus, the examiner has rejected the claims as clearly as possible under the given time constraints.

Arguments about claims 11 and 13 are moot since there are new grounds of rejection.

Regarding the last sentence on page 10 of applicant's remarks, applicant states that Meng does not disclose a compressed video that is play back at an adaptive frame rate. Meng teaches the use of MPEG, as disclosed in section 3 and 4, wherein MPEG uses an adaptive quantization, motion compensation and recursive rate control encoding scheme for changing frame rates. Meng does not specifically disclose playing the frames of the video at a frame rate that corresponds to the visual complexity. However, in column 10, lines 19-47; Rajagopalan discloses the instantaneous coding rate R_I includes video complexity and that the instantaneous coding rate is the rate used for encoding and decoding video image data in that the complexities of I, P and B frames from a group of frames are taken into account for ascertaining an optimal decoding and display rate of the video images at the display terminal. Thus, Rajagopalan discloses adaptive playback of the encoded video according to the statistical complexity.

Regarding claims 4-7, this argument is moot since there are new grounds of rejection.

Regarding lines 7-8 on page 11 of applicant's remarks, applicant asserts that claims 8-9 are not disclosed. The examiner respectfully disclosed. In section 4.1.1 and fig.7, Meng discloses the motion vectors are obtained for measuring the temporal activity of corresponding pixels between group of frames, wherein a group of frames (GOP) comprise I frames and P frames. Thus, claims 8-9 are disclosed.

Thus, the rejection is maintained.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 8-10, 12 and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meng ("Scene Changes Detection in a MPEG Compressed Video Sequence" Proceedings of the SPIE, vol.2419, pg.14-25) in view of Rajagopalan (6,181,742).

Regarding claim 1, Meng discloses a method for playing frames of a video adaptively, comprising:

measuring a spatial frequency of pixel within frames of the video (see section 4.1.1 and fig.7, Meng discloses DCT coefficients are obtained to measure spatial frequency within frames);

measuring a temporal velocity of corresponding pixels between frames of the video (see section 4.1.1 and fig.7, Meng discloses motion vectors are obtained that measures the temporal activity of corresponding pixels between group of frames);

multiplying the spatial frequency by the temporal velocity to obtain a measure of visual complexity of the frames of the video (see section 5.2.1, formula 5 and fig.7, Meng discloses the temporal velocity that is represented by motion vectors comprising dimensions [x, y] in that the motion vectors are multiplied by the spatial frequency indicated by DCT coefficients b0, b1, b2 and b3, and the multiplied result is used to detect scene changes in the group of frames);

playing the frames of the video (section 9 discloses the frames of the video).

Meng does not specifically disclose playing the frames of the video at a frame rate that corresponds to the visual complexity. However, Rajagopalan teaches playing the frames of the video at a frame rate that corresponds to the visual complexity (col.10, ln.19-47; Rajagopalan discloses that the instantaneous coding rate R_I includes video complexity and that the instantaneous coding rate is the rate used for encoding and decoding video image data in that the complexities of I, P and B frames from a group of frames are taken into account to ascertain an optimal decoding and display rate of the video images). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner (Rajagopalan col.3, ln.19-24).

Regarding claim 2, Meng discloses wherein the video is compressed (section 4.1.1).

Regarding claim 3, Meng discloses wherein the spatial frequency is measured from discrete cosine transform coefficients of the pixels in the frames (see section 4.1.1 and fig.7, Meng discloses DCT coefficients are obtained to measure spatial frequency within frames), and the temporal velocity is measured from motion vectors of corresponding pixels between the frames (see section 4.1.1 and fig.7, Meng discloses motion vectors are obtained that measures the temporal activity of corresponding pixels between group of frames).

Regarding claims 8-9, Meng discloses measuring motion vectors and data from I frames and P frames (see section 4.1.1 and fig.7, Meng discloses motion vectors are obtained that measures the temporal activity of corresponding pixels between group of frames, and note I frame and P frame data are obtained).

Regarding claim 10, Meng discloses the visual complexity over a set of frames (see section 5.2.1, formula 5 and fig.7, Meng discloses the temporal velocity that is represented by motion vectors comprising dimensions [x, y] in that the motion vectors are multiplied by the spatial frequency indicated by DCT coefficients b0, b1, b2 and b3, and the multiplied result is used to detect scene changes in the group of frames; also see fig.6). Meng does not specifically disclose the term "averaging". However, it is well known that the averaging of the visual complexity is done for ascertaining the visual representation of the sequence of image data. If one is not convinced, then peruse Rajagopalan in that the averaging of visual complexity over a set of frames to

determine a complexity of a video segment (see col.10, ln.19-47 and col.11, ln.4-7). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner (Rajagopalan col.3, ln.19-24).

Regarding claim 12, Meng does not specifically disclose the frame rate is inversely proportional. However, Rajagopalan discloses in column 12, ln.3-15, when frame rate R is solved, one can see that the frame rate R is inversely proportional to the complexity C. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner (Rajagopalan col.3, ln.19-24).

Regarding claim 14, Meng discloses the video is uncompressed (of course, when the video is being displayed for viewing, the video is uncompressed via a decoding process, as disclosed in the Meng's section 9).

Regarding claim 15, Meng discloses minimizing temporal distortion during video playback (section 9 discloses the frames of the video, wherein quantization is applied for minimization of temporal distortion since the quantization factor is ascertained and utilized in MPEG encoding for permitting the clear display of image data depending on the fine or coarse quantization adjustment that is applied).

Regarding claim 16, Meng discloses (Meng discloses quantization since the quantization factor is ascertained and utilized in MPEG encoding for permitting the clear

display of image data depending on the fine or coarse quantization adjustment that is applied).

Regarding claim 17, Meng does not specifically disclose the minimization using smoothing and filtering of the visual complexity. However, Rajagopalan discloses the minimization using smoothing and filtering of the visual complexity (col.11, ln.30-61, col.12, ln.60 to col.13, ln.14, col.14, ln.18-36, note the disclosure of the visual complexity filtering process by using the equations for SCM_I, SCM_P and SCM_B for minimizing the temporal distortion by taking the complexities of the I, P and B frames of a group of frames).

Regarding claim 18, Meng discloses the minimizing constructs a piece-wise linear approximation of the visual complexity so that visual complexity is substantially linear (see section 4.1.1 and fig.7, Meng discloses DCT coefficients are obtained to measure spatial frequency within frames, and that motion vectors are obtained that measures the temporal activity of corresponding pixels between group of frames, thus, visual complexity is measured and approximated).

Regarding claim 19, Meng does not specifically disclose assigning a constant visual complexity to a consistent temporal segment of the video. However, Rajagopalan teaches assignment of the constant visual complexity to the consistent temporal segment of the video (col.10, ln.19-47; Rajagopalan discloses the use of the instantaneous coding rate R_I that includes video complexity and that the instantaneous coding rate is the rate used for encoding and decoding the segment from a group of frames of the video image data). Therefore, it would have been obvious to one of

ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner (Rajagopalan col.3, ln.19-24).

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meng ("Scene Changes Detection in a MPEG Compressed Video Sequence" Proceedings of the SPIE, vol.2419, pg.14-25) and Rajagopalan (6,181,742) in view of Kituara (5,528,533).

Regarding claims 4-7, Meng discloses the concept of DCT and equations that uses the DCT (see section 4.1.1 and fig.7, Meng discloses DCT coefficients are obtained to measure spatial frequency within frames and motion vectors are calculated). Meng and Rajagopalan do not specifically disclose the basis equation. However, this equation is well known in the MPEG video encoding/decoding art for obtaining the discrete transform coefficients in multidimensional DCTs. If one is not convinced, then peruse Kituara teaching of DCT basis equations (col.1, ln.50 to col.3, ln.44). Therefore, it would have been obvious to one of ordinary skill in the art to combine the well known technique of DCT equation, as suggested in Kituara, in combination with Meng and Rajagopalan for ensuring clear video display by minimizing distortions since these well known techniques of image enhancement have been applied in the MPEG encoding/decoding and image analysis environment.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meng ("Scene Changes Detection in a MPEG Compressed Video Sequence" Proceedings of

the SPIE, vol.2419, pg.14-25) and Rajagopalan (6,181,742) in view of Ashton (5,596,685).

Regarding claim 11, Meng discloses the spatial filtering of the video (see section 4.1.1 and fig.7, spatial frequency is measured by applying DCT for spatially filtering the video). Meng and Rajagopalan do not specifically disclose the term "motion blur". It would have been obvious to one of ordinary skill in the art to visually clear playback of video by applying well known techniques in MPEG coding/decoding and image analysis environments, ie. motion blur, anti-aliasing, spatial filtering, since it is well known for ensuring clear video display by minimizing distortions. If one is not convinced, then peruse Ashton teaching of motion blur for reducing aliasing on image data (col.9, ln.4-10). Therefore, it would have been obvious to one of ordinary skill in the art to combine the well known technique of motion blur, as suggested in Ashton, in combination with Meng and Rajagopalan for ensuring clear video display by minimizing distortions since these well known techniques of image enhancement have been applied in the MPEG encoding/decoding and image analysis environment.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meng ("Scene Changes Detection in a MPEG Compressed Video Sequence" Proceedings of the SPIE; vol.2419, pg.14-25) and Rajagopalan (6,181,742) in view of Strolle (5,596,418).

Regarding claim 13, Meng discloses the spatial filtering of the video (see section 4.1.1 and fig.7, spatial frequency is measured by applying DCT for spatially filtering the video). Meng and Rajagopalan do not specifically disclose the term "coring". However,

coring is a well known technique for removing noise and other superfluous data on image data in the MPEG encoding/decoding and image analysis art (page 19, lines 8-13). If one is not convinced, then see Strolle teaching of the application of coring to the image data (col.41, ln.60-62). Therefore, it would have been obvious to one of ordinary skill in the art to combine the well known technique of coring, as suggested in Strolle, in combination with Meng and Rajagopalan for ensuring clear video display by minimizing distortions since these well known techniques of image enhancement have been applied in the MPEG encoding/decoding and image analysis environment.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "plying" is not understood in the claim, nor is the term "plying" is used in the specification. As it is well understood, the term "plying" is defined as to use or wield diligently or to sew pieces of cloth together. Thus, claim 13 is rendered indefinite.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Allen Wong
Primary Examiner
Art Unit 2621

AW
9/11/07